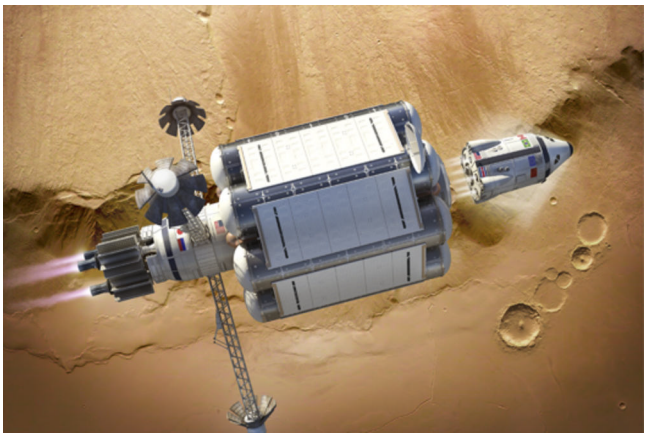
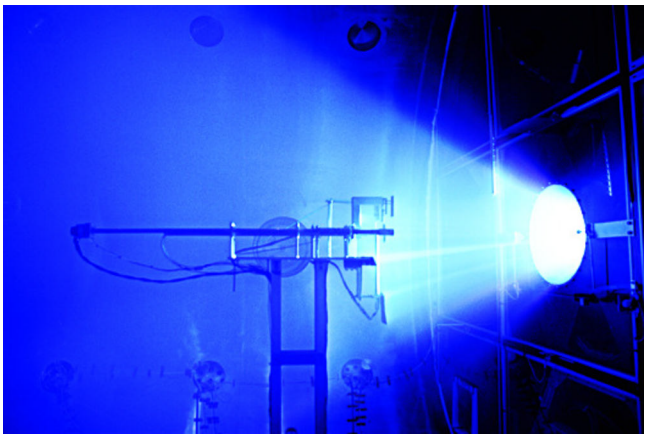
The 123,000 Mph Plasma Engine That Could Finally Take Astronauts To Mars

Veteran Astronaut Franklin Chang Diaz Has Spent Four Decades Developing His Rocket Fueled By Nuclear Reactors And Liquid Hydrogen. Now Nasa Just Might Let It Fly





Article: October 13, 2010. Chang Díaz has spent nearly his entire career laboring to convince anyone who would listen that his idea will work, but that career has also taken several turns in the process. One day in 1980, he was pitching the unlimited potential of plasma rockets to yet another MIT professor. The professor listened patiently. "It sounds like borderline science fiction, I know," Chang Díaz was saying. Then the telephone rang. The professor held up a finger. "Why, yes, he's right here," the surprised engineer said into the receiver, then handed it over. "Franklin, it's for you." NASA was on the line. The standout student from Costa Rica had been selected to become an astronaut, the first naturalized American ever chosen for NASA's most elite corps. "I was so excited, I was practically dancing," Chang Díaz recalls. "I almost accidentally strangled my professor with the telephone cord."

All astronauts have big dreams, but Franklin Chang Díaz's dreams are huge. As a college student, as a 25-year astronaut and as an entrepreneur, his single animating intention has always been to build—and fly—a rocketship to Mars. "Of course I wanted to be an astronaut, and of course I want to be able to fly in this," he says of his plasma-thrust rocket. "I mean, I just can't imagine not flying in a rocket I would build." And now he's close. In four years Chang Díaz will deploy his technology for the first time in space, when his company, aided by up to $100 million in private funding, plans to test a small rocket on the International Space Station. If this rocket, most commonly known by its loose acronym, Vasimr, for Variable Specific Impulse Magnetoplasma Rocket, proves itself worthy, he has an aggressive timetable for constructing increasingly bigger plasma-thrust space vehicles.

Chang Díaz describes his dreams in relatively practical terms. He doesn't intend to go straight to Mars. First he will develop rockets that perform the more quotidian aspects of space maintenance needed by private companies and by the government: fixing, repositioning, or reboosting wayward satellites; clearing out the ever-growing whirl of "space junk" up there; fetching the stuff that can be salvaged. "Absolutely, fine, I'm not too proud to say it. We're basically running a trucking business here," he says. "We'll be sort of a Triple-A tow truck in space. We're happy to be a local garbage collector in space. That's a reliable, sustainable, affordable business, and that's how you grow."

Eventually, though, Chang Díaz intends to build more than an extraterrestrial trucking business, and his ambitions happen to coincide with Barack Obama's call for a privatized space industry that supports exploration well beyond the moon. "We'll start by sending astronauts to an asteroid for the first time in history," Obama said in a major NASA-related address earlier this year at Kennedy Space Center. "By the mid-2030s, I believe we can send humans to orbit Mars and return them safely to Earth."

Such a belief may seem overly ambitious, but the goals of aviation have always seemed that way. In October 1903, for instance, astronomer Simon Newcomb, the founding president of the American Astronomical Society, spelled out a series of reasons why the concept of powered flight was dubious. "May not our mechanicians," he asked, "be ultimately forced to admit that aerial flight is one of the great class of problems with which man can never cope, and give up all attempts to grapple with it?" Less than two months later, the Wright brothers flew at Kitty Hawk. And